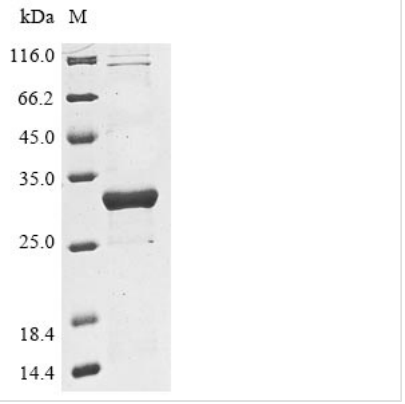
Recombinant Klebsiella pneumoniae Beta-lactamase SHV-3 (bla)

Product Code	CSB-EP327007KBG
Abbreviation	Recombinant Klebsiella pneumoniae bla protein
Storage	The shelf life is related to many factors, storage state, buffer ingredients, storage temperature and the stability of the protein itself. Generally, the shelf life of liquid form is 6 months at -20°C/-80°C. The shelf life of lyophilized form is 12 months at -20°C/-80°C.
Uniprot No.	P30896
Form	Liquid or Lyophilized powder
Storage Buffer	If the delivery form is liquid, the default storage buffer is Tris/PBS-based buffer, 5%-50% glycerol. If the delivery form is lyophilized powder, the buffer before lyophilization is Tris/PBS-based buffer, 6% Trehalose.
Product Type	Recombinant Protein
Immunogen Species	Klebsiella pneumoniae
Purity	Greater than 85% as determined by SDS-PAGE.
Sequence	SPQPLEQIKLSESQLSGRVGMIEMDLASGRTLTAWRADERFPMMSTFKVVLC GAVLARVDAGDEQLERKIHYRQQDLVDYSPVSEKHLADGMTVGELCAAAITM SDNSAANLLLATVGGPAGLTAFLRQIGDNVTRLDRWETELNEALPGDARDTTT PASMAATLRKLLTSQRLSARSQLQLLQWMVDDRVAGPLIRSVLPAGWFIADKT GASERGARGIVALLGPNNKAERIVVIYLRDTPASMAERNQQIAGIGAALIEHWQ R
Research Area	Biochemicals
Source	E.coli
Target Names	bla
Expression Region	22-286aa
Notes	Repeated freezing and thawing is not recommended. Store working aliquots at 4°C for up to one week.
Tag Info	N-terminal 6xHis-tagged
Mol. Weight	33.0 kDa
Protein Length	Full Length of Mature Protein
Image	



(Tris-Glycine gel) Discontinuous SDS-PAGE (reduced) with 5% enrichment gel and 15% separation gel.

Description

Recombinant Klebsiella pneumoniae Beta-lactamase SHV-3 is produced in E. coli and includes the complete mature protein sequence spanning amino acids 22 to 286. The protein carries an N-terminal 6xHis-tag, which simplifies both purification and detection processes. SDS-PAGE analysis confirms protein purity above 85%. This research-only product appears well-suited for controlled applications, with endotoxin levels kept under tight management to support consistent experimental outcomes.

Beta-lactamase SHV-3 represents a key enzyme in bacterial defense against beta-lactam antibiotics like penicillins and cephalosporins. The enzyme works by breaking down the beta-lactam ring structure, essentially neutralizing the antibiotic's effectiveness. Research into this protein may reveal important details about how antibiotic resistance develops, potentially guiding the creation of new treatment approaches and advancing our understanding of bacterial survival mechanisms and resistance pathways.

Potential Applications

Note: The applications listed below are based on what we know about this protein's biological functions, published research, and experience from experts in the field. However, we haven't fully tested all of these applications ourselves yet. We'd recommend running some preliminary tests first to make sure they work for your specific research goals.

1. Antibiotic Resistance Mechanism Studies

Researchers can apply this recombinant SHV-3 beta-lactamase in biochemical assays to explore how Klebsiella pneumoniae develops resistance to beta-lactam antibiotics. In vitro enzyme kinetics experiments allow scientists to map out the substrate specificity and catalytic efficiency of SHV-3 when exposed to different beta-lactam antibiotics—penicillins, cephalosporins, and extended-spectrum variants included. The purified enzyme creates opportunities for controlled testing to measure hydrolysis rates and inhibition constants. This generates concrete data on resistance patterns. The N-terminal His-tag makes purification straightforward and allows for enzyme immobilization in repeated testing.

2. Inhibitor Screening and Development

This recombinant SHV-3 enzyme appears particularly useful as a target for identifying potential beta-lactamase inhibitors in drug discovery work. Scientists can set up high-throughput screening systems with the purified enzyme to test collections of small molecules for their capacity to block beta-lactamase activity. The His-tagged protein attaches easily to nickel-coated plates for ELISA-based inhibition tests, or researchers might prefer solution-based fluorometric or colorimetric screening methods. Such applications may support early-stage research focused on finding new compounds that could make beta-lactam antibiotics effective again.

3. Structural and Biophysical Characterization

The purified recombinant SHV-3 beta-lactamase works well for in-depth structural analysis through X-ray crystallography, NMR spectroscopy, and cryo-electron microscopy to map out this resistance enzyme's three-dimensional structure. Biophysical methods like differential scanning calorimetry, circular dichroism spectroscopy, and dynamic light scattering can reveal details about protein stability, folding patterns, and how the protein assembles into larger complexes. The high purity (exceeding 85%) and His-tag functionality make this protein manageable for the concentration and buffer exchange steps that structural studies typically require.

4. Antibody Development and Immunoassay Applications

This recombinant SHV-3 beta-lactamase may serve as an effective immunogen for creating specific antibodies against this resistance enzyme in laboratory settings. Scientists can introduce the purified protein to laboratory animals for polyclonal antibody production, or the protein can function as an antigen in monoclonal antibody creation through hybridoma techniques. The antibodies that result might prove valuable in Western blotting, immunofluorescence, and ELISA-based detection systems for tracking SHV-3 expression in bacterial cultures or clinical samples during research.

5. Protein-Protein Interaction Studies

The His-tagged recombinant SHV-3 appears suitable for pull-down assays and affinity chromatography experiments aimed at discovering potential protein partners or regulatory factors that interact with beta-lactamases inside bacterial cells. Co-immunoprecipitation studies with the purified enzyme could help map out cellular networks that drive antibiotic resistance mechanisms. Scientists might also consider surface plasmon resonance or bio-layer interferometry experiments to measure binding interactions with other bacterial proteins or possible regulatory molecules.

Reconstitution	We recommend that this vial be briefly centrifuged prior to opening to bring the contents to the bottom. Please reconstitute protein in deionized sterile water to a concentration of 0.1-1.0 mg/mL.We recommend to add 5-50% of glycerol (final concentration) and aliquot for long-term storage at -20°C/-80°C. Our default final concentration of glycerol is 50%. Customers could use it as reference.
Shelf Life	The shelf life is related to many factors, storage state, buffer ingredients,

storage temperature and the stability of the protein itself.
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